

WHAT IS CLAIMED IS:

1. A storage area network inter-fabric services device for use with first and second independent switching fabrics, each independent switching fabric including at least one switching element, the inter-fabric services device comprising:

a first interface adapted to transmit and receive management data from the first independent switching fabric;

a second interface adapted to transmit and receive management data from the second independent switching fabric; and

an inter-fabric adjunct processor coupled to a said first interface and said second interface, said inter-fabric adjunct processor adapted to analyze and respond to management data from the first and second independent switching fabrics.

2. The inter-fabric services device of claim 1, wherein said inter-fabric adjunct processor includes:

a processing unit adapted to analyze the management data from the first and second switching fabrics;

a first fabric map coupled to said processing unit, said first fabric map containing a topology and characteristics for at least one switching element in the first switching fabric; and

a second fabric map coupled to said processing unit, said second fabric map containing a topology and characteristics for at least one element in the second switching fabric.

3. The inter-fabric services device of claim 2, wherein said first and second fabric maps are dynamically updated by said processing unit polling the first and second switching fabrics.

4. The inter-fabric services device of claim 1, wherein said inter-fabric adjunct processor includes:

a processing unit adapted to analyze the management data from the first and second independent switching fabrics; and

a system management control module coupled to said processing unit, said system management control module adapted to manage, on a system level, at least one of the first and second switching fabrics.

5. The inter-fabric services device of claim 1, wherein the first and second switching fabrics operate in a Fibre Channel storage area network.

6. The inter-fabric services device of claim 1, wherein each of said first and second interfaces are either of in-band or out-of-band.

7. The inter-fabric services device of claim 1, wherein said inter-fabric adjunct processor includes:

a first embedded adjunct processor located in a switching element in the first independent switching fabric;

a second embedded adjunct processor located in a switching element in the second independent switching fabric; and

an interconnection link between said first and second embedded adjunct processors.

8. The inter-fabric services device of claim 1, wherein said first and second interfaces are in-band and said interconnection link is out-of-band.

9. A system for logically coupling a first independent switching fabric and a second independent switching fabric, each independent switching fabric including at least one switching element, the system comprising:

an inter-fabric services device coupled to the first independent switching fabric and the second independent switching fabric, said inter-fabric services device adapted to logically manage the first and second independent switching fabrics as a single entity;

a first inter-fabric services agent coupled to said inter-fabric services device and operating on a first switching element in the first switching fabric, said first inter-fabric services agent adapted to communicate with said inter-fabric services device; and

a second inter-fabric services agent coupled to said inter-fabric services device and operating on a second switching element in the second switching fabric, said second inter-fabric services agent adapted to communicate with said inter-fabric services device.

10. The system of claim 9, further comprising:

a second inter-fabric services device coupled to the first switching fabric and the second switching fabric, said second inter-fabric services device adapted to provide a redundant inter-fabric service link.

11. The system of claim 9, wherein said inter-fabric services device and said first and second inter-fabric services agents communicate and register in a unique protocol.

12. The system of claim 9, wherein said inter-fabric services device includes:

a first interface adapted to transmit and receive management data from the first independent switching fabric;

a second interface adapted to transmit and receive management data from the second independent switching fabric; and

an inter-fabric adjunct processor coupled to said first interface and said second interface, said inter-fabric adjunct processor adapted to analyze and respond to management data from the first and second independent switching fabrics.

13. The system of claim 12, wherein said inter-fabric adjunct processor includes:

a processing unit adapted to analyze the management data from the first and second switching fabrics;

a first fabric map coupled to said processing unit, said first fabric map containing a topology and characteristics for at least one switching element in the first switching fabric; and

a second fabric map coupled to said processing unit, said second fabric map containing a topology and characteristics for at least one switching element in the second switching fabric.

14. The system of claim 13, wherein said first and second fabric maps are dynamically updated by said processing unit polling the first and second switching fabrics.

15. The system of claim 12, wherein said inter-fabric adjunct processor includes:

a processing unit adapted to analyze the management data from the first and second switching fabrics; and

a system management control module coupled to said processing unit, said system management control module adapted to manage, on a system level, at least one of the first and second switching fabrics.

16. The inter-fabric services device of claim 9, wherein each of said first and second interfaces are either of in-band or out-of-band.

17. The inter-fabric services device of claim 9, wherein said inter-fabric adjunct processor includes:

a first embedded adjunct processor located in a switching element in the first independent switching fabric;

a second embedded adjunct processor located in a switching element in the second independent switching fabric; and

an interconnection link between said first and second embedded adjunct processors.

18. The inter-fabric services device of claim 9, wherein said first and second interfaces are in-band and said interconnection link is out-of-band.

19. A method for logically coupling two independent storage area network switching fabrics using an inter-fabric service link having first and second interfaces, each switching fabrics including at least one switching element, the method comprising the steps of:

receiving management data at the first interface of the inter-fabric service link from at least one switching element in the first switching fabric;

receiving management data at the second interface of the inter-fabric service link from at least one element in the second switching fabric;

analyzing the management data from the at least one element in the first switching fabric and the at least one element in the second switching fabric; and

coordinating the management of the first and second switching fabrics within the inter-fabric service link.

20. The method of claim 19, further comprising:

maintaining a first fabric map containing a topology and characteristics for at least one switching element in the first switching fabric; and

maintaining a second fabric map containing a topology and characteristics for at least one switching element in the second switching fabric.

21. The method of claim 20, wherein the first and second fabric maps are dynamically updated by polling the first and second switching fabrics.

22. The method of claim 19, wherein the first switching fabric is logically managed on a system level.

23. The method of claim 19, wherein the second switching fabric is logically managed on a system level.

24. The method of claim 19, wherein the first and second switching fabrics operate in a Fibre Channel storage area network.

25. A method for installing an inter-fabric service link between two independent switching fabrics within a storage area network, each switching fabric including at least one switching element, the method comprising:

- coupling at least one switching element in the first switching fabric to the inter-fabric service link;

- coupling at least one switching element in the second switching fabric to the inter-fabric service link;

- registering the at least one switching element in the first switching fabric within a first fabric map contained in the inter-fabric service link; and

- registering the at least one switching element in the second switching fabric within a second fabric map contained in the inter-fabric service link.

26. The method of claim 25, wherein the first and second switching fabrics operate in a Fibre Channel storage area network.

27. An inter-fabric services device for use with first and second independent switching fabrics, each independent switching fabric including at least one switching device, the inter-fabric services device comprising:

- means for receiving and transmitting management data between the first switching fabric and an inter-fabric service link;

- means for receiving and transmitting management data between a second switching fabric and the inter-fabric service link;

- means for processing the management data from the first and second switching fabrics; and

- means for coordinating the management of the first and second switching fabrics.

28. The inter-fabric services device of claim 27, said inter-fabric service link including:

means for generating a first fabric map, said first fabric map containing a topology and characteristics for at least one element in the first switching fabric; and

means for generating a second fabric map, said second fabric map containing a topology and characteristics for at least one element in the second switching fabric.

29. The inter-fabric services device of claim 28, wherein the generating means for the first and second switching fabric maps includes means for polling the first and second switching fabrics.

30. The inter-fabric services device of claim 27, further comprising:
system management control means for managing, on a system level, at least one of the first and second switching fabrics.

31. The inter-fabric services device of claim 27, wherein the first and second switching fabrics operate in a Fibre Channel storage area network.

32. A storage area network comprising:
a first independent switching fabric including at least one switching element;
a second independent switching fabric including at least one switching element;
a first interface adapted to transmit and receive management data from said first independent switching fabric;
a second interface adapted to transmit and receive management data from said second independent switching fabric; and
an inter-fabric adjunct processor coupled to a said first interface and said second interface, said inter-fabric adjunct processor adapted to analyze and respond to management data from said first and second independent switching fabrics.

33. The storage area network of claim 32, wherein said inter-fabric adjunct processor includes:

a processing unit adapted to analyze the management data from said first and second switching fabrics;

a first fabric map coupled to said processing unit, said first fabric map containing a topology and characteristics for at least one switching element in said first switching fabric; and

a second fabric map coupled to said processing unit, said second fabric map containing a topology and characteristics for at least one element in said second switching fabric.

34. The storage area network of claim 33, wherein said first and second fabric maps are dynamically updated by said processing unit polling said first and second switching fabrics.

35. The storage area network of claim 32, wherein said inter-fabric adjunct processor includes:

a processing unit adapted to analyze the management data from said first and second independent switching fabrics; and

a system management control module coupled to said processing unit, said system management control module adapted to manage, on a system level, at least one of said first and second switching fabrics.

36. The storage area network of claim 32, wherein said first and second switching fabrics operate in a Fibre Channel storage area network.

37. The storage area network of claim 32, wherein each of said first and second interfaces are either of in-band or out-of-band.

38. The storage area network of claim 32, wherein said inter-fabric adjunct processor includes:

a first embedded adjunct processor located in a switching element in said first independent switching fabric;

a second embedded adjunct processor located in a switching element in said second independent switching fabric; and

an interconnection link between said first and second embedded adjunct processors.

39. The storage area network of claim 32, wherein said first and second interfaces are in-band and said interconnection link is out-of-band.